

under common management. Further, once given the means of distributing power instead of water, an important extension of the project becomes possible.

Besides supplying power to industries which may locate themselves at Niagara, the power may be transmitted to the existing factories in Buffalo and Tonawanda.

Arrangements are already proceeding to transmit 3000 horse-power to Buffalo, a distance of 18 miles, to work an electric lighting station.

In 1890, Mr. Adams, the President of the Niagara Construction Company, visited Europe to examine systems of power distribution. It was in consequence of this visit that the important modification of the plans of the Company involved in the substitution, to a large extent, of a system of power distribution, for a system of water distribution came to be adopted. The American engineers were anxious to obtain the best European advice as to the methods best suited to the local conditions. A commission was formed, consisting of Lord Kelvin, Dr. Coleman Sellers, Prof. Mascart, and Colonel Turrettini, and an invitation was given to engineers and engineering firms in Europe and America to send in competitive projects for the utilization of the power at Niagara and its distribution to different consumers at Niagara and in Buffalo by electrical or other means. Many of the plans sent in were worked out with great care and completeness. As to the hydraulic part of the projects there was some approach to general consent as to the arrangements to be adopted, but as to the methods of distributing the power there was an extraordinary diversity.

Generally the Commission reported in favour of electrical distribution, with perhaps a partial use of compressed air as an auxiliary method.

Generally also they reported in favour of methods of distribution by continuous currents in preference to alternating currents. Since the date at which the Commission reported, the Frankfort-Laufen experiment has been made, and in the opinion of some electrical engineers a distinct advance has been achieved in the use of alternating currents at high potential.

The Company has not yet decided to adopt any plan for the central stations except in a tentative way. One or more turbines of 5,000 horse-power are to be erected, and probably at first this power will be distributed to Buffalo by an alternating current system.

The cost of a steam horse-power at Buffalo is reckoned at 35 dollars per annum. I believe the Company will be able to deliver power at from 10 dollars for large amounts, and a greater price for small amounts, this price being reckoned for twenty-four hour days.

The new industry of electric lighting has made necessary the provision of large amounts of motive power. Electric traction similarly depends on the supply of motive power. New chemical and metallurgical processes are being introduced which entirely depend for their commercial success on the supply of motive power at a low price.

Niagara is likely to become not only a seat of large manufacturing operations of familiar types, but also the home of important new industries.

NOTES.

WE regret to have to announce the death of Sir Daniel Wilson, the President of Toronto University.

ALTHOUGH the sixth International Geographical Congress will not assemble in London until June, 1895, arrangements are already being made in connection with it. The organizing committee is not quite completed, and the Royal Geographical Society is still adding to it. Among those already nominated are the President of the Society (Sir Mountstuart Grant Duff), the honorary Secretaries of the Society (Messrs. Douglas Freshfield and Henry Seebohm), Sir George Bowen, Sir Charles Wilson, General J. T. Walker, Major Darwin, M.P., Mr. J. Scott Keltie, Sir Frederick Abel, Sir Henry Barkley, and General J. F. D. Donnelly. This committee is busily engaged in making its arrangements.

THERE has been a recrudescence in the eruption of Etna during the past week. We trust that there is a local successor

to the lamented Prof. Silvestri to give us some day a complete history of the phenomena.

THE weather during the past week has been very unsettled, although during the first part the disturbances were mostly confined to the north. The anticyclone which had for some time lain to the westward of our islands moved southwards, and shallow depressions appeared off Scotland. The prevailing winds were consequently westerly or south-westerly, and temperature was rather above the average, except in the north and west, where the daily maxima were frequently below 60°, being some degrees lower than the average. On Sunday a rather deep depression from the Atlantic became central over our islands, accompanied by very heavy rainfall in Ireland and Wales, and rainy weather subsequently spread over the whole of the kingdom; while a considerable fall of temperature and strong northerly winds followed the passage of the depression to the eastwards. The report issued by the Meteorological Council for the week ending the 6th instant shows that the rainfall only exceeded the mean in the north of Scotland; in all other districts there was a deficit. The deficiency was greatest in the south-west of England, where it amounted to eight inches since the beginning of the year.

PROF. LOEFFLER, of the University, Greifswald, has published two articles in the *Centralblatt für Bakteriologie*, on his discovery of, and experiments with, the *Bacillus typhi murium*, and on the result of its application, at the request of the Greek Government, to arrest a plague of field-mice in Thessaly. In view of their scientific interest, these articles have been translated under the direction of Mr. Harting, and will appear in the next number of *The Zoologist*.

VON HELLMUTH PANKOW contributes an article on the dwarf races in Africa and South India to the recent number of the *Zeitschrift der Gesellschaft für Erdkunde*.

A MOST important report of the sugar-cane borers, which do so much harm in the West Indies, from the pen of Mr. W. F. H. Blandford (Lecturer on Entomology, Cooper's Hill), appears in the *Kew Bulletin* for July and August.

THE *Monthly Weather Review*, of the Dominion of Canada, for April 1892 contains notices of aurora seen on almost every day of the month. The most widely-observed display occurred on the 23rd, 24th, and 25th.

THE *Abhandlungen* of the Royal Prussian Meteorological Institute (Bd. I., No. 5) contains a very elaborate investigation, 154 quarto pages, of the aspiration apparatus invented by Dr. R. Assmann, of Berlin, an instrument intended to determine the true temperature and humidity of the air under any conditions. The first apparatus of this kind was invented by Mr. John Welsh in 1853, and was used by him and also by Mr. Glaisher in their balloon ascents, after which time it appears to have been overlooked, or set aside, until it was again reinvented by Dr. Assmann, in a modified form, in 1889. We cannot enter into the construction of the apparatus here, further than stating that by the rotation of discs, the continual renewal of the air in connection with very sensitive thermometers is ensured, by which means sudden changes of temperature which cannot be followed by an ordinary thermometer are indicated. The apparatus is used at the Prussian Institute and at the German colonies in Africa as a standard instrument for the determination of the true temperature and humidity of the air. For ordinary stations however, or for observations at sea, we presume that it is not likely to come into general use.

THE report of the director of the Hong Kong Observatory for the year 1891 contains a table of the monthly and yearly rainfall value for about forty years. The mean yearly value is

90·17 inches, most of which falls between May and September. Dr. Doberck states that there is apparently a little more rain when there are many spots on the sun, but the difference is too slight to be of any practical importance. The east wind is most prevalent at all seasons, the colony being within the region of the trade wind; about 59 per cent. of all winds blow from this quarter, but from June till September there is also a southerly maximum, caused by the monsoon. In winter the temperature is highest with south, and lowest with north wind, and in summer it is highest with south-west, and lowest with east winds. During the year, 213 ships' log-books have been examined for data relating to typhoons, and registers have been regularly kept at about forty stations.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus*, ♂♂) from India, presented respectively by Lieutenant H. S. Wilson and Mrs. Dunnington Jefferson; a Ring-tailed Coati (*Nasua rufa*) from South America, presented by Mr. C. Carrington; an Angolan Vulture (*Gypohierax angolensis*, juv.), a Buzzard (*Buteo* —) from West Africa, presented by Dr. Ferrier; a Spiny-tailed Mastigure (*Uromastix acanthinurus*) from Algeria, presented by Lady Sebright; a Black-headed Caique (*Caique melanocephala*) from Demerara, two Spiny-tailed Mastigures (*Uromastix acanthinurus*) from Algeria, deposited; three Short-headed Phalangiers (*Belidens breviceps*) from Australia, a Hairy Armadillo (*Dasypus villosus*, ♂) from La Plata, a White-throated Capuchin (*Celeus hypoleucus*, ♀) from Central America, four Scarlet Ibises (*Eudocimus ruber*) from Para, purchased; a Testaceous Snake (*Ptyas testacea*) from California, received in exchange.

OUR ASTRONOMICAL COLUMN.

NATAL OBSERVATORY.—The superintendent of the Nata Observatory, in his report for the year 1890-91, tenders his obligations to no less than seven ladies, without whose zealous assistance, he says, the greater part of the numerous astronomical computations, &c., would not have been carried out. Although lacking such aid as is consistent with the proper working of an Observatory, a great amount of very useful work has been accomplished. For instance, the entire mass of meridian observations of the moon made at Greenwich during the period 1851-1861 have been reduced and compared with the theoretical basis of Hansen's Lunar Tables, thus completing the whole number of lunar observations up to the year 1890. The work with the transit, magnetic transit, and equatorial have been continued as usual. For the determination of the latitude of the Observatory 1022 observations of thirty-five pairs of stars have been obtained. Owing to the close proximity of the equatorial and transit instruments, we are informed that it is impossible to use them both at the same time; this should be at once remedied, for the Observatory does not seem to be supplied with many surplus instruments.

The meteorological observations have been made regularly throughout the year. We hope, now that provision has been made for supplying a rain gauge and set of thermometers for each of the coast magistracies, that the Observatory will still continue to urge the necessity of maintaining and extending the system of weather reports, in the interests of the Colony, for, as is now well known, the value of such observations is only maintained when the stations are numerous and well distributed.

GEODETIC SURVEY OF SOUTH AFRICA.—Since the issue of the last (Jan. 1891) report by H.M. Astronomer, Dr. Gill, on the Geodetic Survey carried on in South Africa, the work has been progressing very successfully and swiftly, an average of five principal stations being occupied and completed every month by a single observer. On May 31, 1891, the field work as far as Modder River was completed, the site for the base line being reached the following day. Some difficulty was here encountered with regard to the selection of the position for the base, but it was eventually fixed near Kimberley, the permanent camp being fixed about eight miles from this place. The total length of the measured base was 6000 feet, and it was divided into

sections of 500 feet, since this seemed "a convenient length for a forward and backward measurement in one day." The figures given in this report, although uncorrected for sea-level, &c., speak well for the accuracy of the undertaking, as will be seen from the following table. Each length of 500 feet was measured both forward and backward, and it is the differences of these measurements that are here shown:—

Section.	F - B in feet.	Section.	F - B in feet.
I. ...	+ 0'0025 ..	VII. ...	+ 0'0014
II. ...	- '0020 ...	VIII. ...	+ '0011
III. ...	- '0006 ...	IX. ...	+ '0014
IV. ...	- '0040 ...	X. ...	+ '0009
V. ...	+ '0019 ...	XI. ...	+ '0028
VI. ...	- '0019 ...	XII. ...	+ '0015

The probable error of the whole base was $\pm 0'028$ inches. The lengths of the two sections came out as—

$$M_i = 2999'4445 \text{ feet}$$

$$M_{ii} = 2999'7545 \text{ ,,}$$

The differences between the measured and the computed lengths of Section II. through the triangulation were: by the eastern triangles $M - C_1 + 0'0035$ feet; by the western triangles $M - C_1 - 0'0083$ feet.

During the triangulation work several observations for latitude were made at Tafelberg, Hanover, De Put, and Kimberley Camp, the results showing, as Dr. Gill points out, "that the abnormal deviation of the plumb line found along the coast in the neighbourhood of Port Elizabeth had disappeared." The report concludes with the determinations of the observers' personal equations and two diagrams of the triangulation.

THE INTERNATIONAL CONGRESS OF EXPERIMENTAL PSYCHOLOGY.

WHEN the first Congress on this subject met in Paris in 1889 under the presidency of Prof. Ribot, and with Prof. Charles Richet for its secretary, it proved a vigorous and most successful attempt to gather together from all parts of the world the students of a difficult branch of learning in which some methods of modern physics are being used in psychology, and these methods, or at least their results, are invading the province of what our ancestors would have preferred to call metaphysics. In the opinion of many of the most thoughtful students of the subject it has been considered an important point to keep up the connection between the physiological and the psychological sides of the questions under discussion, and the present Congress under the careful and admirable presidency of Prof. Henry Sidgwick, has proved very successful on this point, and has led to much pleasant acquaintanceship between those whose general work lies in different branches of learning. At Paris the full number at the Congress was about 150, and very little notice was taken of it in England; but at this recent Congress in London there have been nearly twice as many members, and it has received 70 or 80 visitors from all parts of Europe and from the United States and Canada. The vice-presidents have been Prof. A. Bain, Prof. Baldwin, Prof. Bernheim, Prof. Ebbinghaus, Prof. Ferrier, Prof. Freyer, Prof. Delboeuf, Prof. Liégeois, Prof. Preyer, Prof. Richet, and Prof. Schäfer. Among the other well-known names of the visitors there were those of Helmholtz, Binet, Ribot, Henschen (Upsala), Münsterburg (Freiburg), and among the English names Herbert Spencer, Francis Galton, Prof. Oliver Lodge, Prof. Victor Horsley, Dr. Lauder Brunton, and Dr. Hughlings Jackson. The honorary secretaries were Prof. James Sully and Mr. F. W. H. Myers. The rooms of University College were kindly lent to the Congress by Mr. Erichsen for its use during the four days of the meeting (Aug. 1-4). Prof. Sidgwick's address attracted a large audience. He expressed himself as feeling it his first duty to apologize for the choice of England as the place of meeting, inasmuch as England could not be said to be the country which had done most for experimental psychology which, in the common meaning of the terms, had been most advanced in German and French laboratories, and was making recent and rapid progress in America. However, in a slightly different sense of the word the English school of psychologists from Locke and Hume down to Bain and Herbert Spencer had been for the most part experimentalists or at least empiricists. They had before them at this Congress a very wide range of subjects, too extensive he thought on the whole to be covered